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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/547,196

08/26/2005

Miha Fuderer

PHNL030137US

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7590

02/19/2008

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
595 MINER ROAD
CLEVELAND, OH 44143

EXAMINER

FETZNER, TIFFANY A

ART UNIT

PAPER NUMBER

2859

MAIL DATE

DELIVERY MODE

02/19/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/547,196	Applicant(s) FUDERER ET AL.	
	Examiner Tiffany A. Fetzner	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/2/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED Final ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on **7/02/2007** is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement of **7/02/2007**. The initialed and dated information disclosure statement of **7/02/2007** is attached to this office action,

Response to Arguments

3. Applicant's arguments filed 7/2/207 have been fully considered but they are not persuasive, because the applied prior art does teach the concepts which applicant argues to be missing. Additionally applicant argues some features which are not claimed. Arguments concerning features not claimed are not persuasive. Please see the examiner's comment section below since applicant's claims use terminology which is broader than the scope argued by applicant, and the applied prior art still is applicable to what is currently, actually claimed.

Claim Objections

4. **Claim 1** is objected to because the phrase "and/or the properties of selected factors determining said receive situations is vague" The examiner would suggest removing this phrase from claim 1 as the "properties" and "selected factors" being vaguely referenced are not guessable and do not provide a properly defined scope, for the unspecified "receive situations".
5. **Claim 2** is objected to because the phrase "as selected factor" has no antecedent support since claim 2 is now an independent claim.
6. **Claims 3 and 4** are objected to because the phrase "as selected factor" does not clarify or add meaning to the claim, and actually adds an additional vagueness to these claims.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Amended Claims 1-5, 10-13 and New claims 14-16** are still rejected under **35 U.S.C. 102(e)** as being anticipated by **Zhu et al.**, US patent **7,009,396 B2** issued March 7th 2006, filed **September 12th 2002**.

9. With respect to **Method Claim 1, Zhu et al.**, teaches and shows "A magnetic resonance imaging method for forming an image of an object from a plurality of signals sampled in a restricted homogeneity region of a main magnet field of a magnetic resonance imaging apparatus" [See abstract, figures 1 through 4, col. 3 line 65 through col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20], "wherein a patient disposed on a table is moved continuously through the bore of the main magnet" [See figures 1, 2, 3; col. 2 lines 20-50; col. 5 lines 6-42] "and spins in a predetermined area of the patient" (i.e. the homogeneous useable volume, col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20) "are excited by an excitation pulse from a transmitter antenna" [See col. 5 lines 11-13; col. 7 line 60 through col. 9 line 10], "such that an image is formed over a region exceeding largely the restricted region" [See col. 1 line 33 through col. 2 line 17; col. 8 line 64 through col. 9 line 20], "wherein data is undersampled" (i.e. the reduction of the k-space sampling density that leads to aliasing along the phase encoding directions in each of the regional images, is undersampling.) [See col. lines 37-39] "in the restricted region" (i.e. the homogeneous useable volume, col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20) "by means of at least one receiver antenna in a plurality of receive situations being defined as a block of measurements contiguous in time having preserved magnetisation and presaturation conditions within the excited area of the

patient", (i.e. a group of signals from coil 152 is simultaneously sent to a plurality of N receivers" (250, 251, 252) [See col. 5 line 9 through col. 9 line 20] "and fold-over" (i.e. aliasing) "artefacts due to said undersampling are unfolded by means of the sensitivity pattern of the receiver antenna and/or the properties of selected factors determining said receive situations.' [See col. 7 line 60 through col. 9 line 20, especially col. 8 lines 37-41, and col. 8 lines 59-61, where applying SENSE or other parallel imaging reconstruction on the regional images that are produced in parallel generates (i.e. unfolds) a regional image free of aliasing [See col. 8 lines 39-42].]

10. With respect to **Claim 2**, corresponding **apparatus claim 11**, and corresponding **computer program product claim 13 Zhu et al.**, teaches "A magnetic resonance imaging method as claimed in Claim 1, wherein the fold over artefacts...are unfolded" by means of for forming an image of a region of a patient that is larger than a restricted homogeneity region of a main magnet field of a magnetic resonance imaging apparatus from a plurality of signals sampled in the restricted homogeneity region" [See abstract, figures 1 through 4, col. 3 line 65 through col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20], "the method comprising: continuously moving a patient through the restricted homogeneity region of the main magnet field;" [See figures 1, 2, 3; col. 2 lines 20-50; col. 5 lines 6-42] "exciting spins in an area of the patient in the restricted homogeneity region" (i.e. the homogeneous useable volume, col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20) "with an excitation profile as the patient moves through the main magnetic field" [See col. 5 lines 11-13; col. 7 line 60 through col. 9 line 10] undersampling resonance data" (i.e. the reduction of the k-space sampling density that leads to aliasing along the phase encoding directions in each of the regional images, is undersampling.) [See col. lines 37-39] "in the restricted homogeneity region" (i.e. the homogeneous useable volume, col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20) "with receiver antennae which each have a sensitivity pattern as the patient moves through the main magnet field to define a block of measurements contiguous in time having preserved magnetisation and presaturation conditions within the excited region of the patient;", (i.e. a group of signals from coil 152 is simultaneously sent to a plurality of N receivers"

(250, 251, 252) [See col. 5 line 9 through col. 9 line 20] “and generating the image of the region of the patient that is larger than the restricted homogeneity region [See abstract, col. 1 lines 6-11] including unfolding fold-over artifacts due to (a) the undersampling using the sensitivity patterns of the receiver antennae and (b) at least one of: the excitation profile~ ~~as selected factor~~ a magnetization and presaturation profile, and a frequency-response pattern of a receiver. the fold-over artefacts are unfolded by means of the excitation profile as selected factor.” [See col. 7 line 60 through col. 9 line 20, especially col. 8 lines 37-41, and col. 8 lines 59-61, where applying SENSE or other parallel imaging reconstruction on the regional images that are produced in parallel generates (i.e. unfolds) a regional image free of aliasing [See col. 8 lines 39-42].] The same reasons for rejection, which apply to **claim 1** also apply to **claim 2** and need not be reiterated.

11. With respect to **Claim 3, Zhu et al.**, teaches that “the magnetization” (i.e. the B1 field) “and presaturation profile” (i.e. the sensitivity weighting at different table locations for each coil element) is utilized “as a selected factor” for removing (i.e. unfolding) aliasing / ghosting / “fold-over” artifacts in the resulting images. [See col. 5 lines 34-42, col. 7 line 60 through col. 8 line 61.] The same reasons for rejection, which apply to **claim 1** also apply to **claim 3** and need not be reiterated.

12. With respect to **Claim 4, Zhu et al.**, teaches that “the means of the frequency-response pattern of the receiver as” a “selected factor” for removing (i.e. unfolding) aliasing / ghosting / “fold-over” artifacts in the resulting images.” [See col. 7 line 60 through col. 8 line 43; col. 5 lines 6-57]. The same reasons for rejection, which apply to **claim 1** also apply to **claim 4** and need not be reiterated.

13. With respect to **Amended Claim 5, Zhu et al.**, teaches that “during sampling of data within the restricted homogeneity region the table ~~will be~~ is moved over at most one half of the size of the restricted homogeneity region.” [See col. 6 line 8 through col. 7 line 26.] The same reasons for rejection, which apply to **claim 1** also apply to **claim 5** and need not be reiterated.

14. With respect to **Amended Claim 10, Zhu et al.**, teaches that ““A magnetic resonance imaging method for forming an image of an object from a plurality of signals

sampled in a restricted homogeneity region of a main magnet field of a magnetic resonance imaging apparatus, [See abstract, figures 1 through 4, col. 3 line 65 through col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20], “and spins in a predetermined area of the patient (i.e. the homogeneous useable volume, col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20) are excited by an excitation pulse from a transmitter antenna” [See col. 5 lines 11-13; col. 7 line 60 through col. 9 line 10] “such that an image is formed over a region exceeding largely the restriction region, [See abstract, col. 1 lines 6-11] “wherein data is undersampled” (i.e. the reduction of the k-space sampling density that leads to aliasing along the phase encoding directions in each of the regional images, is undersampling.) [See col. lines 37-39] “in the restricted homogeneity region” (i.e. the homogeneous useable volume, col. 4 line 2; col. 1 lines 27 through col. 2 line 50; col. 8 line 28 through col. 9 line 20) “by means of at least one receiver antenna” (i.e. a group of signals from coil 152 is simultaneously sent to a plurality of N receivers" (250, 251, 252) [See col. 5 line 9 through col. 9 line 20] in a plurality of receive situations being defined as a block of measurements contiguous in time having preserved magnetization and presaturation conditions within the excited area of the patient, (i.e. a group of signals from coil 152 is simultaneously sent to a plurality of N receivers" (250, 251, 252) [See col. 5 line 9 through col. 9 line 20] “and fold-over” (i.e. aliasing) “artifacts due to said undersampling are unfolded by means of the sensitivity pattern of the receiver antenna and/or the properties of selected factors determining said receive situations,” [See col. 7 line 60 through col. 9 line 20, especially col. 8 lines 37-41, and col. 8 lines 59-61, where applying SENSE or other parallel imaging reconstruction on the regional images that are produced in parallel generates (i.e. unfolds) a regional image free of aliasing [See col. 8 lines 39-42]].”the sampled data is reconstructed in an iterative manner, in that data sampled largely offset of the centre of the main magnet, which is folding-in” (i.e. ghosting / aliasing) “on the data sampled in the centre of the main magnet, is purposely distorted” [See col. 6 line 8 through col. 8 line 61] “such that a undistorted image is reconstructed and subtracted from the fold-in” (i.e. aliased / ghosted) “image” from the detailed teachings and explanations of [Col. 2 lines 20-51; and col. 3 line 65

through col. 8 line 61.] The same reasons for rejection, which apply to **claim 1** also apply to **claim 10** and need not be reiterated.

15. With respect to New **Claim 14**, **Zhu** teaches "A computer program product stored on a computer usable medium for forming an image, comprising a computer readable program means for causing the computer to perform the method as claimed in **claim 1**." [See col. 3 line 8 through col. 4 line 63] The same reasons for rejection, which apply to **claim 1** also apply to **claim 14** and need not be reiterated.

16. With respect to New **Claims 15**, **Zhu** teaches "A magnetic resonance imaging apparatus having a processor programmed to perform the method as claimed in **claim 1**." [See col. 3 line 8 through col. 4 line 63] The same reasons for rejection, which apply to **claim 1** also apply to **claim 15** and need not be reiterated.

17. With respect to New **Claims 16**, **Zhu** teaches "defining slices in a canted orientation" [See col. 6 lines 4-8] "to orient artifacts in a pre-selected direction." [See col. 8 line 62 through col. 9 line 10.] The same reasons for rejection, which apply to **claim 1** also apply to **claim 16** and need not be reiterated.

18. **Amended Claims 1-5, 10-13, and new claims 14-16 which depend from claim 1**, are also rejected under **35 U.S.C. 102(e)** as being anticipated by **Zhu et al.**, US patent application publication **2004/0051529 A1** published March 18th 2004, which corresponds to the issued above applied reference of **Zhu et al.**, US patent **7,009,396 B2** issued March 7th 2006, filed **September 12th 2002**. Therefore the same reasons of rejection provided previously also apply to the **Zhu et al.**, US patent application publication **2004/0051529 A1** published March 18th 2004, and need not be reiterated for the sake of brevity.

19. **Claims 1-13 and New claims 14-16** which depend from **claim 1**, are rejected under **35 U.S.C. 102(e)** as being anticipated by **Kuhara** US patent application publication **2002/0021128 A1** Published Feb. 21st 2002, filed **April 25th 2001**.

20. With respect to **Method Claim 1**, **Kuhara** teaches and shows "A magnetic resonance imaging method for forming an image of an object from a plurality of signals

sampled in a restricted homogeneity region of a main magnet field of a magnetic resonance imaging apparatus” [See the fourth embodiment paragraphs [0112] through [0120] and figure 10] “wherein a patient disposed on a table is moved continuously through the bore of the main magnet” [See figures 10, paragraphs [0113]-[0114]] “and spins in a predetermined area of the patient are excited by an excitation pulse from a transmitter antenna” [See the fourth embodiment paragraphs [0112] through [0120] and figure 10] “such that an image is formed over a region exceeding largely the restricted region” [See paragraphs [0001] through [0006] “wherein data is undersampled” (i.e. the reduction of the k-space sampling density that leads to aliasing along the phase encoding directions where only half the steps of encoding are performed, is undersampling.) [See paragraphs [0117] and [0118]] “in the restricted region by means of **at least one** receiver antenna in a plurality of receive situations being defined as a block of measurements contiguous in time having preserved magnetisation and presaturation conditions within the excited area of the patient”, [See the second through eighth embodiments paragraphs [0089] through [0169] and figures 3 through 18] “and fold-over” (i.e. aliasing) “artefacts due to said undersampling are unfolded by means of the sensitivity pattern of the receiver antenna and/or the properties of selected factors determining said receive situations.’ [See paragraphs [0112] through [0120], [0156] through [0169]]

21. With respect to **Amended Claim 2**, corresponding **apparatus claim 11**, and corresponding **computer program product claim 13**, **Kuhara** teaches “A magnetic resonance imaging method as claimed in Claim 1, wherein the fold over artefacts...are unfolded~by means of for forming an image of a region of a patient that is larger than a restricted homogeneity region of a main magnet field of a magnetic resonance imaging apparatus from a plurality of signals sampled in the restricted homogeneity region” [See paragraphs [0001] through [0169] as this is a main purpose of being able to move the patient through the homogeneous region of the MRI magnet and apparatus], “the method comprising: continuously moving a patient through the restricted homogeneity region of the main magnet field;” [See paragraph [0095] through

[0097]] “exciting spins in an area of the patient in the restricted homogeneity region with an excitation profile as the patient moves through the main magnetic field” [See paragraphs [0059]-[0072]] undersampling resonance data in the restricted homogeneity region with receiver antennae which each have a sensitivity pattern as the patient moves through the main magnet field to define a block of measurements contiguous in time having preserved magnetisation and presaturation conditions within the excited region of the patient;” and [See paragraphs [0112] through [0120], [0156] through [0169]] generating the image of the region of the patient that is larger than the restricted homogeneity region including unfolding fold-over artifacts due to (a) the undersampling using the sensitivity patterns of the receiver antennae and (b) at least one of: the excitation profile~ as selected factor a magnetization and presaturation profile, and a frequency-response pattern of a receiver. [See paragraphs [0157] through [0169], with paragraphs [0090] through [0120] The same reasons for rejection, which apply to **claim 1** also apply to **claim 2** and need not be reiterated.

22. With respect to **Claim 3**, **Kuhara** teaches that “the magnetization” (i.e. the B1 field) “and presaturation profile” (i.e. the sensitivity at different table locations for each coil element) is utilized “as a selected factor” for removing (i.e. unfolding) aliasing / ghosting / “fold-over” artifacts in the resulting images. [See paragraphs [0147] through [0169]] The same reasons for rejection, which apply to **claim 1** also apply to **claim 3** and need not be reiterated.

23. With respect to **Claim 4**, **Kuhara** teaches that “the means of the frequency-response pattern of the receiver as” a “selected factor” for removing (i.e. unfolding) aliasing / ghosting / “fold-over” artifacts in the resulting images.” [See paragraph [0077] through [0097] with [0157] through [0169] as both the ability to use k-space (i.e. frequency) echo detection and coil sensitivity of the magnetization as the unfolding factor are taught. The same reasons for rejection, which apply to **claim 1** also apply to **claim 4** and need not be reiterated.

24. With respect to **Claim 5**, **Kuhara** teaches that “during sampling of data within the restricted homogeneity region the table ~~will be~~ is moved over at most one half of the

size of the restricted homogeneity region.” [See paragraph [0117] The same reasons for rejection, which apply to **claim 1** also apply to **claim 5** and need not be reiterated.

25. With respect to **Amended method Claim 6**, and corresponding **Amended apparatus claim 12**, **Kuhara** shows “forming a restricted homogeneity region of a main magnet field with a main magnet system of a magnetic resonance imaging apparatus; [See figure 10] continuously moving a patient disposed on a table through the restricted homogeneity region of the main magnet system; [See paragraph [0095] through [0097]] “exciting spins in a predetermined area of the patient” (i.e. from a region to be excited, See figure 14) “with excitation pulses from a transmitter antenna as the patient moves through the restricted homogeneity region; [See paragraphs [0059]-[0072] in combination with figures 11a through 18] “undersampling data from the restriction region” [See paragraphs [0132] through [0169] “with at least one global receiver antenna” (i.e. multiple receiver WB coil 7) “disposed in a fixed relationship to the main magnet system” (i.e. magnet 1) “and a plurality of local receiver antennae” (i.e. 7a, 7b, 7c) “disposed in a fixed relationship to the patient on the table” [See figures 12 through 18] ~~are provided~~ “to move therewith to generate a block of measurements continuous in time having preserved magnetization and presaturation conditions within the excited area of the patient; [See paragraphs [0129] through [0169] “reconstructing the block of measurements to generate images which have fold-over artifacts due to the undersampling,” [See paragraph [0133] through [0169] “the generated images, spanning an imaged region of the patient which is larger than the restricted homogeneity region;” [See paragraphs [0135] and [0136] as one example of this teaching] “and unfolding fold-over artifacts using sensitivity patterns of the global and local receiver antennae. [See paragraphs [0156] through [0169]] The same reasons for rejection, which apply to **claims 1, 11** also apply to **claims 6, 12** and need not be reiterated.

26. With respect to **Amended Claim 7**, **Kuhara** teaches that “a reference scan is provided for obtaining the sensitivity pattern of the global and local receiver antennae” (i.e. WB coil 7 and local coils 7a, 7b, 7c, with the coil-sensitivity-distribution-measuring scan of paragraph [0133] is one example) “for each receiver antenna element.” [See

paragraph [0136] The same reasons for rejection, which apply to **claim 6** also apply to **claim 7** and need not be reiterated.

27. With respect to **Amended Claim 8**, **Kuhara** teaches that “data is acquired in a number of discrete reference scan segments at different table positions in the restricted region” [See paragraphs [0146] through [0169] “~~wherea-wherein~~ during each reference scan the table stands still” [See paragraphs [0146] through [0169] as one example where holding the patient table stationary, is an already known and taught prior art alternative to the ability to move the table automatically while obtaining the measurements desired, and does not constitute a novel, or nonobvious difference.] “and from the data obtained by the reference scans the sensitivity patterns of the local receiver antennae coils are calculated”. [See paragraph [0129] through [0169] as examples for the ability to calculate the sensitivity distribution.] The same reasons for rejection, which apply to **claims 6, 7** also apply to **claim 8** and need not be reiterated.

28. With respect to **Amended Claim 9**, **Kuhara** shows from figure 14 that “the table is moved at a speed which is less than half of the restricted homogeneity volume region of the main magnet system over the scan time of k-space”, ~~whereas~~ “k-space is being continuously scanned in a row-to-row manner, and the sensitivity profiles of the local ~~coils are~~ receiver antennae being calculated by interpolation of the measured profiles at different table positions.” [See paragraphs [0094] through [0097], with paragraphs [0112] through [0169]]. The same reasons for rejection, which apply to **claims 6, 7** also apply to **claim 9** and need not be reiterated.

29. With respect to **Amended Claim 10**, **Kuhara** teaches “A magnetic resonance imaging method” [See paragraphs [0001] through [0169] as ~~claimed in claim 10~~, “for forming an image” [See abstract] “of an object from a plurality of signals sampled in a restricted homogeneity region” [figure 14] “of a main magnet field of a magnetic resonance imaging apparatus.” [See figures 10, 11a, 11b, 12, 14, 15, 16a, 16b] “wherein a patient disposed on a table is moved continuously through the bore of the main magnet” ; [See paragraph [0095] through [0097]] “and spins in a predetermined area of the patient are excited by an excitation pulse from a transmitter antenna” [See figure 12], “such that an image is formed over a region exceeding largely the restriction

region, [See paragraphs [0135] and [0136] as one example of this teaching] “wherein data is undersampled in the restriction region by means of at least one receiver antenna in a plurality of receive situations being defined as a block of measurements contiguous in time having preserved magnetization and presaturation conditions within the excited area of the patient, and fold-over artifacts due to said undersampling are unfolded by means of the sensitivity pattern of the receiver antenna and/or the properties of selected factors determining said receive situations,” [See paragraphs 0089] through [0169] and figures 10 through 18] wherein the sampled data is reconstructed in an iterative manner” [See figures 17, 18], “in that data sampled largely offset of the centre of the main magnet” [See paragraphs [0116] through [0118], “which is folding-in” (i.e. ghosting / aliasing) “on the data sampled in the centre of the main magnet, is purposely distorted” [See paragraph [0118] “such that a undistorted image is reconstructed and subtracted from the fold-in” (i.e. aliased / ghosted) “image” from the detailed teachings and explanations of [paragraph [0112] through [0169] The same reasons for rejection, which apply to **claim 1** also apply to **claim 10** and need not be reiterated.

30. With respect to New **Claim 14**, **Kuhara** teaches “A computer program product stored on a computer usable medium for forming an image, comprising a computer readable program means for causing the computer to perform the method as claimed in **claim 1.**” [See paragraph [0074] through [0079]] The same reasons for rejection, which apply to **claim 1** also apply to **claim 14** and need not be reiterated.

31. With respect to New **Claims 15**, **Kuhara** teaches “A magnetic resonance imaging apparatus having a processor programmed to perform the method as claimed in **claim 1.**” [See paragraph [0074] through [0079]] The same reasons for rejection, which apply to **claim 1** also apply to **claim 15** and need not be reiterated.

32. With respect to New **Claims 16**, **Kuhara** teaches that the coils may be located obliquely [See paragraphs [0097] and [0101] additionally teaches that the coils may be located at upper/lower and right/left sides of an object, which directly suggests that it is possible to “define slices” for imaging “in a canted orientation” (i.e. slanted, oblique or beveled direction based on the applying coils geometrical direction) “to orient artifacts in a pre-selected direction.” (i.e. to arrange the artifacts along the z-axis) [See paragraphs

[0110] through [0169]] The same reasons for rejection, which apply to **claim 1** also apply to **claim 16** and need not be reiterated. to **claim 1**

Examiner's Comment

33. The examiner notes that applicant's claims call for the feature of "having preserved magnetisation and presaturation conditions within the excited region of the patient;" but that applicant has failed to specify the scope of this limitation (i.e. what applicant considers to meet the criteria of "having preserved magnetisation and presaturation conditions within the excited region of the patient;" because **how** applicant is obtaining preserved "magnetisation and presaturation conditions within the excited region of the patient;" (i.e. what is being done in applicant's invention to achieve this) or what applicant is doing in order to ensure "having preserved magnetisation and presaturation conditions within the excited region of the patient;" is not specified within the claim language.) Due to the lack of explanation by applicant the examiner is forced to make the assumption that because the **Kuhara** reference is performing these measurement in parallel and substantially at the same time that in **Kuhara** for a specific series of measurements those measurements have a "preserved magnetisation and presaturation conditions within the excited region of the patient;"

34. The examiner also notes that while applicant argues that the applied prior arts fail to acquire signals in parallel, the applied prior arts use multiple receivers to detect signals at the same time, from their respective locations, therefore the measurements are being done in parallel. Additionally Zhu does teach using the sensitivities to correct for aliasing and reduce a corrected image. That process is what is meant by the term "unfolding", therefore the ability to "unfold" is within the Zhu applied prior arts.

35. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

36. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Prior Art of Record

37. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) **Zhu** US patent application publication 2003/0004408 A1 published Jan. 2nd 2003, filed April 19th 2001.

B) All of the **Brittain** and **Brittain et al.**, references noted on the attached Notice of references cited.

Conclusion

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday, Wednesday, and Friday-Thursday from 7:00am to 2:10 pm., and on Tuesday and Thursday from 7:00am to 5:30pm.

39. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Dean Reichard**, can be reached at (571) 272-1984. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(571) 273-8300**.

40. Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/TAF/
February 19, 2008

/Brij Shrivastav/
Primary Patent Examiner
Technology Center 2800